UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Remedying Undue Discrimination Through Open-Access Transmission Service and Standard Electricity Market Design

Docket No. RM01-12-000

NOTICE, AGENDA, and STAFF PAPER FOR THE OCTOBER 2nd STAFF CONFERENCE ON MARKET MONITORING

(September 20, 2002)

As announced in the Notice of Staff Conference on Market Monitoring, issued August 28, 2002, the staff of the Federal Energy Regulatory Commission (Commission) will hold a conference on Wednesday, October 2, 2002 to discuss and further develop the essential elements that should be required in a standard market monitoring plan. The conference will be held at FERC, 888 First St. NE, in Washington D.C., in the Commission Meeting Room.

Staff is convening this conference to get additional public input on developing a standard market monitoring plan. The staff may then propose additional detail for such a plan, on which the public will then be given opportunity to comment..

The goal of this conference is to discuss the development of a standardized market monitoring plan to assist in evaluating the performance of wholesale electric markets and the conduct of individual market participants. The conference will include a discussion of standard indices, data and reporting needed to implement the market monitoring plan effectively. Attached is the conference Agenda as well as a staff discussion paper on standard market metrics.

The public is invited to attend. There is no registration or fee.

The conference will be transcribed. Those interested in acquiring the transcript should contact Ace Reporters at 202-347-3700, or 800-336-6646. Transcripts will be placed in the public record ten days after the Commission receives the transcripts. Additionally, Capitol Connection offers the opportunity for remote listening and viewing of the conference. It is available for a fee, live over the Internet, via C-Band Satellite. Persons interested in receiving the broadcast, or who need information on making

arrangements should contact David Reininger or Julia Morelli at the Capitol Connection (703-993-3100) as soon as possible or visit the Capitol Connection website at http://www.capitolconnection.gmu.edu and click on "FERC."

For additional information, please contact Saida Shaalan at 202-502-8278, or by e-mail to saida.shaalan@ferc.gov.

Magalie R. Salas
Secretary

Attachments: Conference Agenda
Staff "Strawman"

Remedying Undue Discrimination Through Open-Access Transmission Service and Standard Electricity Market Design **Docket No. RM01-12-000**

Agenda for the
SMD Conference on Market Monitoring
Wednesday, October 2, 2002

Panel I Academics, FTC, DOJ, and others **9:30 a.m. - 11:00 a.m.**

- **Paul Joskow**, Massachusetts Institute of Technology, Economics
- **John Hilke,** Federal Trade Commission
- **Jade Eaton,** Department of Justice, Attorney
- **Kenneth Rose**, National Regulatory Research Institute
- **Kristin Domanski**, Energy Security Analysis Inc.
- **Scott Harvey**, LECG

Panel II Market Monitoring Units **11:00 a.m. - 12:30 a.m**

- **David Patton,** Independent Consultant, MISO
- **Anjali Sheffrin,** CAISO
- **Frank Wolak**, Stanford University, CAISO
- **Robert Ethier,** ISO NE
- **Steve Balser**, ISO NY
- **Joseph Bowring**, PJM ISO

Both panels will cover the same topics, but from a different perspective: The first will be a theoretical discussion of what needs to be done as we move towards establishing a standard set of metrics. The second panel will discuss what has been done in practice, what successes they have had, what impediments they have encountered, and what can be done to assist in resolving the difficulties.

The first half hour of each panel will address the first set of issues (below) and whether the "strawman" we issued includes the topics that need to be addressed. The second hour can then deal with a variety of issues associated with using a standard set of metrics such as data availability, regional differences, etc. as well as broader issues addressing market participant access to the data.

First half hour of each panel - standard set of metrics and the strawman:

- What aspects of the market should MMUs be monitoring and what are the metrics?
- Does the "strawman" capture these?
- Are there metrics which are missing?
- To what degree should MMUs be monitoring general market behavior vs. individual market participant behavior?

Last hour of each panel - data and regional issues and market participant accessability to the data:

- What data limitations are there in monitoring and what can FERC do to address them ?
- What, if any, differences in monitoring are appropriate by region? (Are some additional metrics likely to be needed in some regions?)
- What data or information needs to be available to the market to function properly?
- What data or information needs to be kept confidential for the market to function properly and protect corporate interests?

Lunch Break **12:30 p.m. - 1:30 p.m.**

Panel III NYMEX, CFTC, SEC, and **others** **1:30 p.m. - 2:15 p.m.**

- **Robert Levin,** NYMEX
- **Randall Dodd,** Professor , Financial Advisor
- **William Kokontis**, CFTC
- **Alton Harvey,** SEC
- **Robert Nordhaus**, Energy Attorney

This panel will address how other regulatory entities have dealt with market monitoring.

- What are the lessons learned from monitoring other markets and individual market players?
- What is the reality of what can be monitored, as opposed to the ideal?
- How should data needs of the market be balanced against corporate needs for confidentiality?
- What additional metrics are needed (e.g. financial)?

Break **2:15 p.m. - 2:30 p.m.**

Panel IV Market Participants 2:30 p.m. - 4:00 p.m.

- **Mayor Sasson**, Consolidated Edison
- **Linda Clarke**, Exelon Power Team
- **Susan Kelly**, NRECA
- **Jolly Hayden**, Calpine
- **John Stout**, Reliant
- **Edison Elizeh**, Pacificorp

This panel will address monitoring individual companies vs. the broader market.

- What is the appropriate level and depth of monitoring individual market behavior?
- To what degree should this monitoring be by MMU versus by the FERC?
- How does this compare to current MMU monitoring of individual participant behavior?
- What are the appropriate metrics with which to monitor?

Panel V Consumers and State Representatives 4:00 p.m. - 5:00 p.m.

- **George Stojic**, Michigan Public Service
- **Mark Reeder**, NYPSC
- **Mark Cooper**, Consumer Federation of America
- **Denise Goulet**, PA Office of Consumer Advocate

This panel is to obtain the state and consumer perspective of standard market monitoring and their reaction to the day's discussion and the positions taken.

- What is the reaction to what has been discussed today regarding standardizing a market monitoring plan?
- What monitoring issues have not been discussed or proposed in the "strawman" that need to be addressed for a comprehensive and balanced monitoring program?

"Strawman" Staff Discussion Paper on Market Metrics SMD Staff Conference on Market Monitoring

Docket No. RM01-12
October 2, 2002

This paper explores what standard metrics the annual market monitoring reports proposed in the SMD NOPR might use to report on their markets. The paper proposes a core set of metrics to serve as a "strawman" for further development and detailed specification of standard metrics.

The SMD NOPR discusses some of the ways market monitors have measured the structure of their markets and the conduct of market participants (¶438) and requests comment on how the market monitor should develop useful measures that permit interregional comparisons (¶442.) Many of the techniques and measures underlying the annual reports and analyses are similar across market monitoring units (MMUs), stemming from common purposes and economic principles. However, differences among these analyses hinder comparability of results across existing ISO/RTO markets. These differences arise from several sources, including ISO/RTO market design, information collected, resource configurations, analytical approaches, and presentation. Although some of these differences will remain under SMD, it is important to adopt a standard set of market metrics as we move toward a standard set of design elements under SMD.

This paper seeks to advance the discussion toward specific metrics that can measure how well the markets operated by Independent Transmission Providers (ITPs) under SMD[1] function. The MMUs have recognized the need for such metrics and a working group of market monitors has drafted an initial catalog of metrics. The following discussion of reporting standards draws on this work[2], on market monitoring reports, and on the general literature. We first address broad measurement categories and then discuss core measures for each category.

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[1]This discussion also applies to existing RTO/ISO markets, to the extent that these markets correspond to the markets proposed under SMD.

[2]"A Catalog of Market Metrics", (Market Monitoring and Working Group, EISG April 2002, Alberta Canada).

Measurement Categories

A virtually endless list of statistics is provided in the literature on market monitoring. We focus first on a limited set to address key questions about the SMD markets and to group statistics broadly for purposes of discussion and comment. No single set of metrics will cover all possibilities within a category, and there are gray areas between the defined categories. Nevertheless, our grouping serves to facilitate comparable analyses. The following categories frame the discussion of specific metrics:

- General market functioning
- Assessment of market structure
- Assessment of market performance
- Evaluation of participant conduct

General Market Functioning

General metrics of the state of the markets start with a general description of the market and changes over the year, emphasizing measures such as:

- energy market prices
- quantities delivered
- ancillary services prices
- transmission usage and pricing
- major input costs, such as fuel, and
- market ratios, such as a ratio of spot and forward prices.

These measurements come from specific observed quantities available in the normal course of operations, and serve as the basis for development of further measures and analyses, such as concentration measures or time series analysis of markets.

Although these measurements are not directly tied to a particular index of market power or market efficiency, standardization will permit better comparison across regional markets and time periods. It will also facilitate the development of other standard metrics specifically intended as indices of market structure or performance.

Market Structure Metrics

The MMUs need first to identify the geographic market for the products and identify load pockets. This is a necessary condition for applying metrics to measure market structure and performance.

Typical structural indicators highlight the competitiveness and efficiency of the market, in the defined relevant markets. We expect structural indices to be controversial, however structural measures, such as HHI or a measure of pivotal supply can serve as indicators of the state of the market structure, and, if properly standardized, permit comparisons across markets.

The SMD NOPR proposes to require each market monitoring unit (MMU) to perform a structural analysis to address market structure and performance prior to implementation of SMD (¶439) and to update this analysis annually[3]. The scope of the geographic market will change over time, as supply and demand conditions change. This changing scope will need to be addressed in a structural analysis that identifies transmission constraints and load pockets.

Developing such indicators must permit ongoing evaluation of changes over time in the market and comparison of structural analyses across markets. We recognize that the precise relationship between the structure of the market and the performance of the market (either in aggregate or by individual participants) will remain controversial.

Market Performance Metrics

Performance measures typically focus on whether market outcomes are consistent with outcomes expected in a competitive market, whereas structural measurements examine whether the underlying market conditions suggest many different sellers can compete to serve load and sellers can reach many different buyers. Performance measures address what generators or loads *actually* do, whereas structural measures address what generators or load *potentially* can do. For example, market power is a structural characteristic of markets with certain properties (monopolistic or highly concentrated ownership), whereas the exercise of market power is an indicator of market performance associated with market outcomes, such as prices and quantities. A concentrated market (as measured

[3]The SMD NOPR requires this analysis in order to implement market mitigation, but the analysis should also provide essential background for the application of the market metrics.

by a high HHI) would be taken as a structural condition that might be expected to lead to the exercise of market power (as measured by a Lerner index that indicated the price markup over cost was above a competitive level.)

Aggregate market performance measures should cover a wide range of markets (e.g., energy markets, ancillary services, capacity revenue rights), periods (e.g., day ahead and real time markets, longer term) and conditions (e.g., prices in relation to costs, output in relationship to capacity, market depth and liquidity.) Since no single measure will satisfy all the purposes of performance measurement, a balanced group of measures will be needed. Clear identification of each measure is important, so the theoretical and practical implications of applying each measure are understood. It is also important that measures be feasible to implement with data accessible to the market monitors.

Market Conduct Metrics

General statistical measures help identify patterns of anomalous market outcomes that appear to indicate undesirable behavior by individual market participants. For example, unexplained jumps in power prices that appear to have no basis in fundamentals such as fuel prices or high loads may indicate and exercise of market power. Therefore, the market performance measures, discussed above, can be a useful starting point in identifying problems of conduct.

However, general measures of market performance are unlikely to apply to individual participant conduct. General measures may indicate a need for further investigation, but drawing a line between outcomes that are caused by difficult-to-measure fundamentals (such as scarcity) and difficult-to-measure undesirable behavior (such as economic withholding) remains a matter of analytic judgment. Mitigation tools that can be employed *ex ante* may be preferable to *ex post* monitoring, but metrics to monitor the behavior of individual participants will remain important.

Core Metrics

In this section, we discuss specific core metrics that can be used to measure market structure and performance across RTOs. These measures will also provide a basis for meaningful assessment of the state of each market over time. The specifics of measures must identify necessary data and calculations. Specifying the data and methods applicable across regional markets permits these measures to be used to compare performance across RTOs. All MMUs will

produce the core set of measurements. However, we encourage the development of innovative measures beyond this core set to address regional differences and to identify new metrics that could be added to the core set if the metric provides useful insight across all RTOs.

The SMD NOPR expresses the Commission's intent to "require the use of a core set of questions and techniques" (¶436.) Questions, metrics and techniques are interrelated: standard metrics can provide a clear and comparable basis for answering some of the key core questions, but we recognize that many questions will require customized responses. Our purpose here is to begin to identify those metrics with a consensus on their value and calculation. The discussion below also raises questions relating to the use some of these metrics.

General Market Functioning

There needs to be a list of general market indicators focused on key concerns about the function of the markets proposed in the SMD NOPR. As a minimum, MMUs should provide general background information identifying major submarkets including recurring load pockets and describing the size of the markets, the generation mix, transmission constraints, and export/import patterns. The reported information should include the following SMD markets:

- Energy markets (day ahead and real time, peak and off-peak)
- Ancillary services–regulation, spinning and non-spinning reserves (day ahead and real time)
- Transmission markets including CRRs (by term)

For each of these markets, separate information should be provided on quantities and prices for the following groupings:

- Overall market, for example the average load-weighted hourly price for the entire ITP.
- Submarkets, such as energy and ancillary service prices, provided by delivery/load zone and time period.
- Transmission prices for CRRs from each of the CRR auctions.
- Congestion charges in the day ahead and spot markets, provided for overall market and for major transmission paths.

These statistics should be provided on a monthly, seasonal and an annual basis. We seek comment on additional market information groupings that should be part of a standard package.

Market Structure Metrics

Concentration measures form the principal measure of market structure, with the HHI being used most commonly by the DOJ and in FERC analyses for mergers and market based rates. In the analysis of market based rates, FERC also employs the concept of a pivotal supplier, measuring the degree to which the supply of a single firm is needed to meet market demand in an area. These measures are designed to provide an indication of market power for a defined market, with market power being defined as the ability to raise the price above the competitive level.[4] Although it can be argued that the link between concentration and market power is not always conclusive, it still provides a useful measure of competitive market structure, particularly when used in conjunction with other measures. However, it is important to clearly define the basis for calculating any specific concentration measure. The HHI can be based on one or more methods for measuring market share, including the following:

- HHI based on ownership shares of installed capacity, measured seasonally, and for submarkets where transmission constraints are frequently binding.
- HHI for energy output, calculated from hourly generator output, for an overall market and for specific classes of generator (baseload, intermediate and peak units.)
- HHI based on capacity of units that are near the market clearing price, defined as units that are bid within a fixed percentage of the market clearing price in each hour.

We seek comment on the appropriate methods for measuring market share in the calculation of HHI. There are other possible structural measures for which staff would like comment, including the concept of pivotal supply noted above. Although less widely used than the HHI measure, the use of the pivotal supplier concept may provide certain advantages in electricity markets, where non-storability of electricity and the time-varying (and largely inelastic) natures of electricity demand are important.

In addition to these specific measures, there is a need to develop some measure of structural incentives for withholding, where firms with units near the

[4]Depending on the use of the definition, the definition is sometimes expanded to require that the price rise be profitable to the firm, that the price rise be sustained for some period of time, or to require that the exercise of market power result in a misallocation of resources.

market clearing price (typically peaking units) hold large amounts of lower priced (typically baseload) capacity that could profit from economic withholding of the marginal units, or from physical withholding of small amounts of baseload capacity that would force the peaking units to set the marginal price.

Market Performance Metrics

Competitive markets are efficient, and workably competitive markets should reflect an appropriate measure of efficiency. The SMD NOPR proposes that the annual assessment of market performance compare the actual market results with a benchmark for a competitive market (¶440), and cites studies using a simulated benchmark (¶437), but does not specify how that benchmark should be obtained.

There are many issues about whether a price benchmark should be based on costs and how to incorporate costs in calculating the benchmark. Simple methods of incorporating costs in a benchmark are desirable where feasible, but simple methods can be misleading in a complex market, because they will leave out key factors that may determine market prices and quantities. Computer simulation of prices and quantities is one alternative, but it is difficult to identify cost components (such as temporal opportunity costs), to get data, and to develop and implement such a modeling approach.

In some cases, using simple production cost estimates to replace bids in the dispatch, and estimating the market clearing price with these cost-based bids, might yield a reasonable estimate of a market clearing price, particularly if some adjustment is made for opportunity costs. Some key cost elements will still be missing from the approach, but results might form a reference point for measurement and comparisons. We believe there may be useful cost-based benchmarks, but seek comment on how to trade off complexity of approach with accuracy of results.

An alternative to basing a benchmark directly on costs is to base it on some estimate from in-merit bids during prior periods that are deemed competitive. This alternative is potentially attractive, in part because using averages of prior in-merit bids is one approach proposed in SMD, along with cost-based approaches, for setting default energy bids (¶420). This approach also has the advantage that the data needed are easier to obtain in the normal course of business and raise

fewer issues of information confidentiality than approaches based on detailed generator production costs. However, reliance on generator bids rather than independent assessment of costs leaves open the relationship between the competitive benchmark and the costs of production, raising the issue of whether this approach satisfies the need to assess whether loads are being served at least cost. We seek comment on whether the use of the approach can be reconciled with the need to base a performance assessment on the overall cost efficiency of the market.

Market Conduct Metrics

Any assessment of individual behavior is extremely difficult, given the number and range of factors that need to be considered, and raises issues of data availability, access and confidentiality. Consequently, metrics for evaluation of conduct will need considerable additional study and analyst judgment. Nevertheless, because we know that individual conduct can include exercises of market power and attempts to game the market rules, there will continue to be a need for metrics to monitor the behavior of individual participants. For example, market monitoring units will need to continue to examine physical withholding through monitoring of patterns of outages, deratings and scheduling by generators, and to examine economic withholding through monitoring of bidding behavior of individual participants.

One possible core approach to evaluate conduct is to identify potential anomalies in bidding patterns, whether these anomalies are measured against prior bidding behavior or against some external standard such as estimated input costs. A metric for this purpose would be to measure patterns of how generator supply offers change as a function of bid price, by measuring shifts in quantities offered in different price ranges. We seek comment on whether this type of metric can assist in analyzing participant conduct, and on what other metrics might be useful.

Table 1 presents a list of key questions to address, suggested core metrics that could be used to address those questions, and comments on applying those metrics. It is organized around the categories discussed above. Staff proposes the metrics presented in Table 1 as the starting point for the discussion of standardization.

Table 1: Summary of Principal Market Metrics

General Market Functioning		
Question(s) Addressed	**Metric(s)**	**Application Notes**
Competitive Nature of Market: • Are market outcomes consistent with expectations for competitive markets? • How often is the price cap binding?	**For Day Ahead (DA), Real Time (RT), Ancillary Services, and Congestion and Congestion Revenue Right (CRR) Markets:** • Prices, including year to year comparisons • Number of hours and quantity of load at bid cap price • Quantities, including year to year comparisons	Look for price and quantity anomalies
Inter-market Efficiency: • Is arbitrage occurring between markets in a competitive manner? • Are prices in neighboring markets converging?	• Ratio of DA and RT prices • Ratios of energy prices to ancillary service prices (regulation, spinning, non-spinning) • Ratio of spot to forward prices • Frequency and duration of imports/exports inconsistent with price differentials • Spark spreads (natural gas)	On locational, temporal, and type of service basis

General Market Functioning		
Question(s) Addressed	**Metric(s)**	**Application Notes**
Demand Responsiveness: • Is demand unresponsive to price in a manner that facilitates the exercise of market power? • To what degree is metering in place? • How is demand response providing alternatives to new supply?	• MW of demand response capabilities in energy and ancillary service markets • Load weighted % of demand bids that are price responsive • % of load with real-time metering capability • Price elasticity of demand • Changes in those demand response capabilities (spread of technology)	Analysis of formal demand response programs as well as simple demand responses to price. Retail rate barriers will reduce demand response
Load Pockets: • What are the individual load pockets?	• Listing and description of individual load pockets	How should load pockets be determined?
Transmission Constraints: • Are transmission constraints limiting the development of competition in energy markets? • Where is congestion creating distinct separate load pockets? • Is the congestion inefficient (are there cheaper alternatives that are not exploited)?	• Frequency, duration and location of congestion • Level of congestion revenues • CRR revenue shortfall • Instances of nodal prices above highest bid taken • Pivotal supplier analysis • Seller HHIs and N-firm ratios • Buyer HHIs and N-firm ratios	All by load pocket

General Market Functioning		
Question(s) Addressed	**Metric(s)**	**Application Notes**
Effects of Mitigation Actions: • To what extent are administrative solutions relied upon? • Are market mitigation actions impeding the competitive operation and development of energy markets?	• Number and duration of mitigation instances • Cost of mitigation from non-competitive load pockets created by constraints	By region What is/should be the degree of subjectivity or discretion in imposing mitigation?
Risk: • Is the level of exposure to spot market prices appropriate? • Are levels of hedging of transmission service appropriate?	• % exposure to spot market • % of transmission service hedged (with CRRs)	

Market Structure		
Question(s) Addressed	**Metric(s)**	**Application Notes**
Ownership and Control: • Does the distribution of ownership and control of assets support competition? • Does the distribution of ownership and control of assets support market development?	• Hirschman-Hirfindahl Index (HHI) of base ownership/control • N-firm concentration ratio of base ownership/control, • HHI of capacity of units within a fixed percentage of the market clearing price • Pivotal Supply Analysis/Residual Supply Index For Each Supplier (measure of degree to which a supplier is critical to the market) • Market supply curves • Supply Elasticity	Disaggregate measures by supply category (base, intermediate, peak) and load level Apply to overall regional market, and congested major load pockets Is information on control of assets available?
Long Term Market Structure: • How long does it take from project announcement to entrance in the market? • Are long-term resources sufficient?	• Current and anticipated reserve margins • HHIs including actual and proposed entrants • Entrants by role in market (baseload, intermediate, peaking unit), and by fuel • Degree of entry barriers (e.g. siting, environmental...)	Perform calculations for major congested zones

Market Performance		
Question(s) Addressed	**Metric(s)**	**Application Notes**
Efficiency of Short-Term Market: • Are short-term markets operating efficiently? • How much are short-term market results diverging from competitive outcomes? • Is price set by the true marginal resource? • Is dispatch efficient?	• Lerner Index comparing actual hourly prices with benchmark of marginal energy costs • Price-cost markup comparing actual hourly prices with benchmark marginal energy costs • Price-cost markup comparing actual hourly prices with actual marginal energy costs on an aggregate basis and on an individual peak hour basis	Determine benchmark from historical bidding patterns and/or variable cost estimates Base benchmark clearing price on simple dispatch model or more complex simulation.
Withholding: • Is generation capacity being withheld from the market that is economic? • Are observed high prices caused by withholding or scarcity?	• Output gap analysis –difference between actual hourly output with benchmark of economically available capacity. • Output gap analysis –ratio of actual hourly output with economically available capacity. • Difference between total generation capacity with benchmark of economically available capacity • Ratio of total generation capacity with benchmark of economically available capacity • Deratings (Number, quantity, frequency) • Scheduled and forced outages (Number, quantity, frequency)	Develop hourly benchmark of economically available output, using supply function analysis based on historical patterns or on cost analysis of generation. Do by region and by fuel type Case studies/audits of high priced hours may be needed Analyze deratings and outages on the basis of conditions and participant characteristics

Market Performance		
Question(s) Addressed	**Metric(s)**	**Application Notes**
Liquidity: • Are markets sufficiently liquid? • Will markets continue to be sufficiently liquid?	• Number of supply options (unaffiliated suppliers) in short-term markets • Number of supply options (unaffiliated suppliers) on a long-term basis • Percent of load that is long term • Supply (Capacity, Firm Energy, and Firm Demand Response) available in the bilateral market as a % of load	Calculate current, 1 year, 5 years, and 10 years forward
Long Term Market Performance: • Is market pricing consistent with need for new entry? • Are longer term market outcomes efficient? • Is entry profitable for generation, for transmission, and for demand resources?	• Average price including long-term contracts • Price cost margin including long-term contracts • % of contracts that are long-term • Correlation between spot and long-term prices • Net revenue analysis of pricing and entry costs for base, intermediate and peaking plants. • Net revenue analysis of pricing and entry costs for demand resources. • Net revenue analysis of pricing and entry costs for transmission alternatives	(As calculated by CAL-ISO) Requires a significant amount of data on bilateral markets Base net revenue analysis on energy market and on all-in compensation including all sources

Market Participant Conduct		
Question(s) Addressed	**Metric(s)**	**Application Notes**
Participant Conduct: • Is bidding behavior consistent with competitive behavior? • Are market participants following established rules? • Do bids reflect marginal opportunity costs?	• Bids by price bin (weekly average of bids for incremental energy compared to dispatched incremental MW) • Instances of failures to follow rules • Plant audits for outages	Plant audits for outages (forced and otherwise)